

REMARKS

The Official Action of August 24, 2004, and the prior art relied upon therein have been carefully reviewed. The claims in the application are now claims 1-13, and these claims define patentable subject matter warranting their allowance. Accordingly, applicant respectfully and earnestly requests favorable reconsideration and allowance.

New method claim 13 has been added. This is somewhat more detailed than the other claims, but basically calls for the same subject matter. New claim 13 is patentable for the same reasons as the other claims, as pointed out below.

Claims 1-4 have been rejected as obvious under Section 103 from Hart USP 5,842,401 (Hart) in view of Schäfer USP 5,460,026 (Schäfer). This rejection is respectfully traversed.

Hart discloses a typical continuous hole punch apparatus, in this case for punching circular holes along the edges of a continuous sheet of paper as shown in Fig. 1. The paper sheet 10 is passed between the nips of two pairs of rollers as shown in Figs. 2 and 3, the upper rollers being provided with axially extending projections which serve as punch members, and the lower rollers having complimentary

holes which receive the projections from the upper rollers during the hole punching operation.

Viewed in its broadest sense, Hart might be considered a starting point for the present invention, although there are differences even here in that applicant's method and apparatus acts on metal sheet or foil rather than paper, and the holes punched by applicant's method and apparatus (claims 3, 4 and 13) are not circular. Again, in its broadest sense, Hart shows no more than the acknowledged prior art noting applicant's specification under the heading "Background Art" at pages 1-4.

The contour or configuration of the projections in Hart are not problematic in the punching of holes in paper, but the use of an apparatus such as shown by Hart for the punching of metal sheet or foil presents problems which are explained in applicant's specification starting at about the middle of page 2:

Japanese Patent Laid-Open No. 133936/1985 discloses a method of continuously manufacturing drilled metal sheets by rotating a drilling roller having a multiplicity of projections as a method of improving the productivity of the drilled metal sheets by increasing a drilling speed. The manufacturing of this metal sheet is done in the following manner. Namely, first, a metal sheet is passed continuously between a roller provided with a multiplicity of saw tooth-like projections on an outer circumferential surface thereof and a receiving roller, and holes are

thereby drilled by the projections with burrs raised at the same time.

Burrs are either not formed in Hart because the material punched with holes is paper, or if burrs are formed this is not a problem with paper. But it is a problem with metal sheet or foil, and Hart provides not the remotest suggestion of how to solve such a problem (and neither does Schäfer as pointed out below).

The problem is further explained with regard to the punching of holes in metal sheet or foil continuing at the bottom of page 2 of applicant's specification from the end of the quotation above, as follows:

The drilled metal sheet advances continuously, and the burrs impinge upon an end of a scratch jig provided ahead of the drilled metal sheet, the burrs being thereby folded back.

This system permits an increase in productivity, but problems continue to exist:

Namely, the thickness of the burr-folded-back portions becomes nearly two times that of the metal sheet. When this metal is used as a drilled metal sheet for a secondary battery electrode base, the volume of the metal sheet itself increases when the metal sheet with an active material deposited on a surface thereof and wound is loaded into a battery case, and the quantity of the active material loaded into the battery jar therefore decreases correspondingly,

Hart does not provide the skilled artisan with the remotest hint of how to eliminate such burrs, which burrs are eliminated according to the present invention.

Schäfer discloses a method and apparatus for the cutting of an opening in a hollow body, the Schäfer system using an hydraulic drive as illustrated. As pointed out in the Abstract and elsewhere in Schäfer, the end of the plunger is shaped to correspond in shape to the wall being cut. Thus, the Abstract states in part as follows: "..., an opening can be formed in a wall of the workpiece by advancing a plunger ... to partially cutout **a piece of the wall corresponding in shape to the plunger**" (emphasis added).

This is clearly seen in Fig. 1 where the curvature of the face of the plunger matches the curvature of the wall H of the workpiece. This correspondence in shape is also mentioned at column 3, lines 61-63 as follows:

The inner contour 12 of the die 1 will correspond to the outer contour of the workpiece H when forming is complete.

Thus, to the person of ordinary skill in the art, not guided by applicant's own specification which of course was not available to the skilled artisan at the time the present invention was made, Schäfer is no different than Hart insofar as conforming the face of the plunger or projection to the curvature of the workpiece being punched. In Hart the face of

the projection is flat thus matching the flat surface of the paper. In Schäfer the face of the plunger is slightly curved to match the curvature of the workpiece H.

Thus, in both Hart and Schäfer the person of ordinary skill in the art is taught to match the face of the plunger or projection to the workpiece being punched. In the present invention, very much to the contrary of both Hart and Schäfer, the face of the projection which carries out the punching operation to produce openings without burrs is very different from the metal sheet or foil being punched, with the result being that opening in the metal sheet or foil is cut in a sequence as illustrated in Fig. 4 of the present application. Therefore, even if it were obvious to combine the references, not conceded by applicant, such combination would not correspond to applicant's invention.

To briefly summarize, the penetration system of the present invention is quite different from that of both Hart and Schäfer. The penetration sequence according to the present invention is shown in applicant's Fig. 4. In the first stage, the leading edge of the projection initiates the cut; subsequently, the trailing edge cuts through the metal sheet or film; last, the central portions are cut through. In Schäfer, to the contrary, there is either no sequence at all, i.e. the cutting is done simultaneously about the entire

periphery, or at least opposite edges are cut at the same time.

Moreover, the shape in side elevation of the side surfaces of applicant's blade or projection is quite different from that of Schäfer. The shape in side elevation of side surfaces of the cutting blade or projection of the present invention is set forth in detail in claim 2. In Schäfer, to the contrary, one circumferential end portion is equal to the other circumferential end portion in height.

The three basic requirements for establishing a *prima facie* case of obviousness are set forth broadly in MPEP 2143, and in more detail in MPEP 2143.01-2143.03. Applicant respectfully submits that none of these three requirements are present in the proposed combination of Hart in view of Schäfer.

First, the prior art provides no suggestion or motivation for the proposed combination. Although both references relate to making holes or openings by punching, the requirements of Schäfer (which uses a non-continuous system rather than a continuous system as in Hart) are such as to make its use very questionable in a continuous process, it being noted that Schäfer requires a sequence of steps including changing internal pressure. This could not be done in Hart.

The person of ordinary skill in the art considering Schäfer would be most unlikely to ignore what Schäfer indicates is most important. Therefore, the proposed combination would not have been obvious.

Second, the references do not provide any reasonable expectation of applicant's results. Neither reference appears to face the problem faced by applicant and solved by applicant. Such a problem is not even mentioned in the two references. The prior art thus provides no reasonable expectation of providing applicant's successful result.

Third, as already pointed out in detail above, the references together do not teach or suggest all the features claimed. Thus, as pointed out above, both references are consistent in matching the face of the cutting or punching element to the curvature of the surface being cut or punched, which is antithetical to the present invention.

Withdrawal of the rejection is in order and is respectfully requested.

Although claims 6-12 are not included in the statement of the rejection, it appears that these claims were intended to be included. Regardless, applicant's arguments presented above are fully applicable to claims 6-12, as well as new claim 13. Hart in view of Schäfer, even if it were obvious to combine these references (respectfully denied for

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reasons pointed out above), would not result in applicant's claimed subject matter.

Applicant believes that all issues have been addressed and resolved above, and that it should be clear that applicant's claims define novel and unobvious subject matter under Sections 102 and 103, and therefore the rejections should be withdrawn and the claims allowed. Such are respectfully requested.

Respectfully submitted,

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